REMARKS

Entry of the foregoing, reexamination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 1-34 were pending. Claims 17, 18 and 26-34 have been withdrawn from further consideration as being directed to a non-elected invention. By the present response, claims 1, 4, 8, 11, 12, 14-16, 21 and 24 have been amended. Claims 35-37 have been added. Thus, upon entry of the present response, claims 1-16, 19-25 and 35-37 are pending and await further consideration on the merits.

Support for the foregoing amendments can be found at least in the following locations of the original disclosure: paragraphs [0018]-[0054]; and the original claims.

CLAIM OBJECTIONS

Claims 4, 8 and 16 stand objected to on the grounds set forth in paragraph 4 of the Official Action. By the present response, claims 4, 8 and 16 have been amended in the manner which addresses these informalities. Thus, reconsideration and withdrawal of the objections is respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Claims 1-16 and 19-25 stand rejected under 35 U.S.C. §112, second paragraph, on the grounds set forth in paragraph 6 of the Official Action. By the present response,

applicant has addressed the rejections set forth in items A-G and I. Thus, reconsideration and withdrawal of these grounds for rejection is respectfully requested.

With regard to item H, claim 21 has been amended in a manner which is believed to address the rejection. Thus, reconsideration and withdrawal of the rejection of claim 21 is respectfully requested.

With respect to claim 20, the rejection is respectfully traversed. Claim 20 stands rejected on the grounds that the phrase "substantially identical" is not identical, and thus fails to comply with the requirements of 35 U.S.C. §112, second paragraph. Applicant respectfully traverses this assertion.

First, there is no disagreement that the term "substantially identical" does not mean the same thing as the term "identical." However, this fact does not render the phrase "substantially identical" unclear or indefinite. To the contrary, use of the modifier "substantially" is a widely practiced claim drafting technique, and is one that has been sanctioned by the reviewing authorities:

> [c]laims need only 'reasonably apprise those skilled in the art' as to their scope to satisfy the definiteness requirement. . . in addition, the use of modifiers in the claim, like 'generally' and 'substantial', does not by itself render the claims indefinite.

Seattle Box Co. v Industrial Crating & Packing, Inc., 731 F.2d 818, 828-29, 221 USPQ 568, 575-76 (Fed. Cir. 1984).

Thus, in light of the above, reconsideration and withdrawal of the rejection is respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §102

Claims 1-8, 10, 16 and 19-21 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,597,771 to Hu et al (hereafter "*Hu et al*") on the grounds set forth in paragraph 8 of the Official Action. Reconsideration and withdrawal of the rejection is respectfully requested.

The present invention is directed to an improved adsorbent catalyst for purifying exhaust gases or combustion gases, especially exhaust gases from gasoline, diesel or natural gas-burning engines. More particularly, the adsorbent catalyst formed according to the principles of the present invention is effective in the purification of exhaust gases, even under non-steady state operation conditions. Namely, modern engines experience variable operating conditions with respect to their air/fuel ratios (A/F = λ). Thus, for example, engines may operate on the dilute side for extended periods (λ = 1.1-2.4). However, at other times, the engine operates at or near stoichiometric conditions (λ = 1), or even under rich air-fuel ratio conditions ($\lambda < 1$).

The above-described tendency toward extended operations under dilute air-fuel ratio conditions has made the removal of pollutants from the combustion gases difficult.

According to the present invention, an adsorbent catalyst is provided which seeks to attain effective removal of pollutants from the combustion gases during all of the above-described operating conditions.

According to the present invention, an adsorbent catalyst formed according to the principles of the present invention is set forth in amended claim 1. Amended claim 1 recites:

1. An adsorbent catalyst for reducing amounts of nitrogen oxides, hydrocarbons and carbon monoxide contained in exhaust or combustion gases, wherein the catalyst adsorbs nitrogen oxides when the exhaust or combustion gases contain an excess of oxygen, and liberates and reduces the adsorbed nitrogen oxides when said gases contain oxygen in stoichiometric amounts or less, the adsorbent catalyst comprising a porous support material containing at least the following components:

(i) a first catalytic metal comprising Pt;

(ii) a first NO_x adsorbent comprising at least one of the following metals: Ba and Sr;

(iii) a second NO_x adsorbent comprising at least one of the following metals: La and Y; and

(iv) a redox NO_x adsorbent comprising at least one of the following metals: Ce, Zr, Ti, Nb, Mn, Pr, Nd, Sm, Eu and Gd;

wherein components (i)-(iv) are present in an amount effective to adsorb nitrogen oxides when the exhaust or combustion gases contain an excess of oxygen, and liberate and reduce the adsorbed nitrogen oxides when said gases contain oxygen in stoichiometric amounts or less.

Hu et al fails to anticipate the presently claimed invention as set forth, for example, in amended claim 1.

Hu et al is directed to a layered catalyst composite of the three-way conversion type. The catalyst described therein is said to have the capability of substantially simultaneously catalyzing the oxidation of hydrocarbons and carbon monoxide, and the reduction of nitrogen oxides. Such three-function catalysts are described, for example, in paragraph [0003] of the present specification.

However, as explained, for example, in paragraph [0003] of the present specification, such three-function catalysts are designed to operate under conditions where the air/fuel ratio is as close to 1 as possible (i.e. - stoichiometric).

By contrast, the adsorbent catalyst according to the presently claimed invention operates not only under stoichiometric conditions, but also under conditions wherein the exhaust or combustion gases contain an excess of oxygen ($\lambda > 1$), as well as under rich conditions, or sub sub-stoichiometric conditions ($\lambda < 1$).

In this regard, as is readily apparent from the above, amended claim 1 requires that components (i) - (iv) be present " in an amount effective to adsorb nitrogen oxides when the exhaust or combustion gases contain an excess of oxygen, and liberate and reduce the adsorbed nitrogen oxides when said gases contain oxygen in stoichiometric amounts or less."

Moreover, while *Hu et al* discloses the inclusion of "a stabilizer" such as Ba and/or Sr (column 19, lines 57-61, and claim 13) and "a promoter" such as La and/or Nd (column 11, lines 65-67), these described stabilizes and promoters do not satisfy the requirements of amended claim 1, in particular with regard to the recited first NO_x adsorbent, and second NO_x adsorbent, which as noted above must be present in an amount effective to adsorb nitrogen under non-stoichiometric conditions.

For at least the reasons noted above, *Hu et al* fails to anticipate the presently claimed invention as set forth in amended claim 1. Thus, reconsideration and withdrawal of the rejection is respectfully requested.

The remaining claims rejected over *Hu et al* are dependent from amended claim 1. Thus, these claims are also distinguishable over *Hu et al* for at least the same reasons noted above.

Newly present claim 37 can also be distinguished over the teachings of *Hu et al* for at least the reasons noted above.

Claims 1, 5, 8-9, 16 and 19-21 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,071,850 to Friedman (hereafter "*Friedman et al*") on the grounds set forth in paragraph 10 of the Official Action.

Friedman et al discloses a multi-layer catalytic element, and a method of forming the same using electrophoretic deposition.

The construction disclosed by *Friedman et al* consists of a first catalyst support material carrying a first catalyst, as well as a second catalyst support material carrying a second catalyst. However, the adsorbent catalyst of the presently claimed invention requires at least three additional components which are not disclosed by *Friedman et al* (i.e., components (ii) - (iv)). In this regard, *Friedman et al* clearly fails to disclose, or even suggest, an adsorbent catalyst which includes, in addition to a first catalytic metal, a first NO_x adsorbent, a second NO_x adsorbent, and a redox NO_x adsorbent, as required by the presently claimed invention. Moreover, *Friedman et al* also clearly fails to disclose, or even suggest, providing these components in an amount which is sufficient to adsorb nitrogen oxides under conditions where there is an excess of oxygen, as well as reduce the adsorbed nitrogen oxides when the amount of oxygen is present in stoichiometric amounts, or less.

For at least the reasons noted above, reconsideration and withdrawal of the rejection is respectfully requested.

The remaining claims depend either directly or indirectly upon claim 1. Thus, these claims are also distinguishable for at least the same reasons as noted above.

Newly presented claim 37 is also distinguishable for at least the same reasons noted above.

ALLOWABLE SUBJECT MATTER

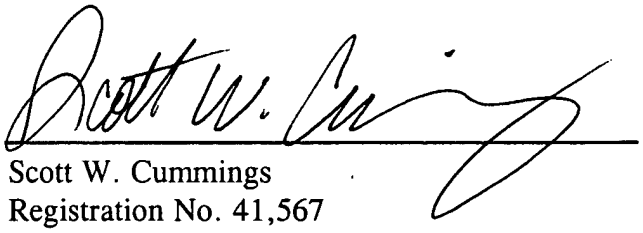
Applicant notes with appreciation the indication, as set forth in paragraph 11 of the Official Action, that claims 11-15 and 22-25 contain allowable subject matter.

CONCLUSION

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: 

Scott W. Cummings
Registration No. 41,567

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

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